## REMARKS

In the final Office action, independent claims 1 and 10 were again rejected under 35 U.S.C. 102(b) as being anticipated by Cochran, of record. In addition, dependent claims 7-9 were again rejected under 35 U.S.C. 103(a) as being unpatentable over either Cochran by itself, Cochran combined with Rather et al., of record, or Cochran combined with Wisner et al., of record. The examiner reiterated the same arguments used in the first Office action. Claims 2-6 and 11-15 were considered to contain allowable subject matter. In response, independent claims 1 and 10 were amended to more specifically recite and particularly point out the invention intended to be claimed by the Applicant. Applicant respectfully traverses the rejection of claims 1 and 7-10 and offers the following remarks in support of this position.

Issue

The primary issue appears to be whether or not Cochran teaches receiving slope and amplitude information for each subaperture from the wavefront sensor and processes that information to weight the slope information with a weighting function of the amplitude information to produce weighted slopes?

Examiner's Position

The examiner states in the final Office action that Cochran teaches a recalculation of the estimation matrix $H^T$ "on a millisecond basis in order to deal with scintillation, the variation of the intensity of the light . . ." (col. 6, lines 8-12). The examiner maintains that Cochran does anticipate receiving slope and amplitude data in the subapertures of sensor 22 and raises the question "Where else but at the wavefront sensor 22 would scintillation (variations in intensity, or amplitude) be detected?". The examiner further maintains that Cochran anticipates weighting based on amplitude and slope data since matrix $H^T$ is recalculated "on a millisecond basis" to provide for intensity variations. Hence, the examiner asserts that both slope and amplitude data are used in Cochran to perform slope weighting in equation $b = H^T s$.

Applicant's Position

Applicant contends that Cochran does not teach and anticipate receiving the slope and amplitude information for each subaperature from the wavefront sensor and processing the slope and amplitude information to weight the slope information with a weighting function of said amplitude information to produce weighted slopes as recited, in substance, in amended independent claims 1 and 10.

Support For Applicant's Position

Cochran teaches that only slope data s is input from the wavefront sensors and that such slope data is multiplied (weighted) by a transpose of an estimation matrix H which is prepared based on the actuator subaperture Jacobian or wavefront sensor derivative, i.e. derivatives of the wavefront slope measurements with respect to movement of the actuators (see col. 5, lines 4-24). Cochran further teaches the possibility of changing the estimation matrix in real time which gives rise to the ability to adjust it [the estimation matrix] very rapidly as environmental conditions vary to give improved performance. Cochran states "adjustment [of the estimation matrix] to currently existing atmospheric parameters as they change should be possible. It should be possible to continuously calibrate [the estimator] for weather effects such as wind gusts at high altitudes." (starting at col. 5, line 64 to col. 6, line 7).

Accordingly, Cochran is teaching the possibility of changing the estimation matrix H based on current measurements of atmospheric and weather conditions, not on specific measurements from the wavefront sensors. Note that in Cochran s is representative of only the wavefront sensor slope measurements and H is prepared from the derivatives of the wavefront slope measurements and not from amplitude measurements from the wavefront sensors. Therefore, changing of the estimation matrix H in Cochran does not include amplitude measurements from the wavefront sensors. Also, the weighting of the slope measurements s by the transpose of the estimation matrix $H^T$ in Cochran does not include any amplitude measurements.

It appears that the examiner is attempting to draw an inference from the description in Cochran at col. 6, lines 9-12 which reads "to recalculate the estimator on a millisecond basis in order to deal with scintillation, the variation of the intensity of light (not just phase) that causes the familiar twinkling of stars.". The inference to be drawn is that since Cochran makes reference

to dealing with scintillation that his system must somehow extract amplitude measurements from the wavefront sensors and somehow insert them into the estimation matrix because as the examiner states in the final Office action "Where else but at the wavefront sensor 22 would scintillations (variations in intensity, or amplitudes) be detected?"

However, in order to draw the inference posed by the examiner, one must ignore the preceding description of Cochran as noted above starting at col. 5, line 64 to col. 6, line 7 in which Cochran is teaching the possibility of changing the estimation matrix H based on current measurements of atmospheric and weather conditions, not on specific measurements from the wavefront sensors. If the description in Cochran referenced by the examiner is not taken out of context, but rather taken together with the preceding text, it is clear that Cochran is teaching changing the estimation matrix to deal with scintillation based on current measurements of atmospheric and weather conditions, and not on amplitude measurements from the wavefront sensors.

The description of Cochran at col. 6, lines 9-12 as noted above does reference "the variation of the intensity of light", but makes no mention of amplitude measurements. The reference of Cochran in lines 9-12 to "the variation of the intensity of light (not just phase) that causes the familiar twinkling of stars." is merely Cochran's definition of what is scintillation. The examiner again appears to be reading more than what was intended into this statement by attempting to draw the inference that since intensity of light was stated, then amplitude measurement somehow is implied which is not the case at all.

Conclusion

In conclusion, the description of Cochran at col. 6, lines 9-12 referenced by the examiner to draw the inference that since Cochran makes reference to dealing with scintillation that his system must somehow extract amplitude measurements from the wavefront sensors and somehow insert them into the estimation matrix is taken out of context with the preceding description of Cochran. When taken in context with the preceding description, it is clear that the inference fails because Cochran is teaching changing the estimation matrix to deal with scintillation based on current measurements of atmospheric and weather conditions, and not on amplitude measurements from the wavefront sensors. Thus, Cochran does not teach and

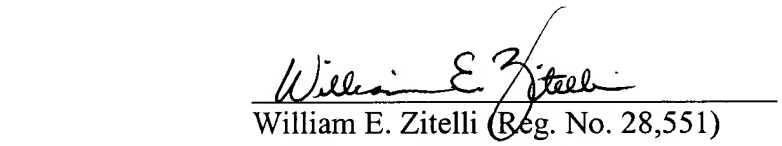
anticipate receiving the slope and amplitude information for each subaperature from the wavefront sensor and processing the slope and amplitude information to weight the slope information with a weighting function of said amplitude information to produce weighted slopes as recited in amended independent claims 1 and 10. Therefore, amended claims 1 and 10 are novel and patentably distinguishable over Cochran for at the reasons given above.

Since claims 7-9 are dependent from claim 1 and include all of the limitations thereof, then they are also considered patentably distinguishable over Cochran, either taken individually or in combination with the other references, of record.

Applicant acknowledges that claims 2-6 and 11-15 are considered to contain allowable subject matter, but considers all of the amended and remaining claims of the instant application allowable.

In view of the above, the application is considered in condition for allowance and therefore, an early issuance thereof is earnestly solicited.

Respectfully submitted,



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